THE CRITICAL SUCCESS FACTORS THAT AFFECTING TECHNOLOGY INNOVATION IN THE MANUFACTURING INDUSTRIES AT MALAYSIA

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ABSTRACT

Based on the previous researches on reveal the dissemination of innovation found that most of people wanted to accept the reserve technology completion consequent from the success of any technology innovation. Thus, some economists doing an assessment on the study have definite that to form the firm network and in creating a strong network effect, they need to have a stronger technology innovation.

Innovation is now unavoidable for companies which want to develop and maintain a competitive advantage and/or gain entry into new markets. Asheim and Isaksen (1997), Michie (1998), it also represents one of the main factors underlying countries' international competitiveness and their productivity,output and employment performance.

It is crucial that researchers in the respective industries continuously create new innovations. To encourage and facilitate such innovations, the Government of Malaysia has put in place various funding schemes for the necessary research and development to be conducted. Inventions to Innovation and Commercialisation Centre and to cooperate with the Innovation and Commercialisation Centre in all matters, including providing full technical details of the Invention, relevant market information (if any), prior art documents and names of all Inventors who have contributed intellectually to the creation of the Invention. This study try to study the following relationship, to determine relationship between knowledge management factor in the technology innovation at Malaysia, to define the effects of rules and regulation into the technology innovation, to examine the relationship of management on technology innovation and to investigate the relationship of financial support in implementing technology innovation.

Keywords: Technology Innovation, Critical Success Factors, Manufacturing Industries, and Affecting.

INTRODUCTION

In Malaysia, even though it is clear that it is not "innovating" at the frontier. So far, Malaysia has only learned to use imported new technology and equipment from the more advanced countries. However, it is time to upgrade Malaysia from the assembly stage to manufacturing, design and development of new products. Comparing the R&D expenditure, it is clear that Malaysia is still behind many other nations such as Korea, Singapore, India and China.

According to Ruggles (1998) and Scarbrough (2003), knowledge management is an approach to adding or creating value by more actively leveraging the knowhow and expertise resided in individual minds. As indicated by MacDuffie (1995), Ichniowski et al. (1997), Youndt et al. (1996), Delery et al. (1996), Mendelson et al. (1999), Collins et al. (2003), based on previous literatures they have paid attentions to the link of HR practices and organizational outcomes such as productivity, flexibility, and financial performance, however Laursen *et* al (2003), but the understanding needs to be extended related to innovation performance. Although a firm has access to the knowledge, skills and expertise of employees, it may need to possess good capacities in managing knowledge management tools in place to ensure effective utilization of the human capital in the development of organizational expertise for innovation.

Accordingly by Hobday (1996), Narayanan *et* al. (2000), Rasiah (2003), Ariffin *et* al. (2004), the problems of in doing innovation because of lacking researches on innovation by the main factor is less on the studies in using the R&D activities in Malaysia. Unfortunately, Malaysia is less gives an attention to solve this problem after got little evidence and still don't mind for the important of policy directions. Compare to the other countries such as Singapore, China and Vietnam, Malaysia is at the last place in the number of scientists and engineers in R&D and researchers except for S&E enrollment relative to first degree enrolment and post-graduate enrolment. This shortage is made worse due to the 'brain drain' problem. Therefore, the innovation policy should take into account both the demand side (e.g. tax credit for R&D and research grants) and supply side (e.g. supply of qualified researchers, scientists and engineers) to enhance the discovery and innovation process. In addition, opportunities should be given to the best available resources, where it may promise a better outcome.

Furthermore, according to A. Hoecht *et* al. (2006), the sense of management in technology innovation is broadly and diversity. They admits by despite there is many difficulty and hesitation in managing innovation and also in producing output development is found out. There is a success and the things done and processes that necessary to do if innovation is already considerable agreement on many of the factors that contribute to be to occur. Over the past 50 years there have been lot of studies of innovation attempting to understand not only the factors necessary for it to occur, but how they influence the process and when and where they are required and in what order.

However, as indicated by Rothwell (1992), he fined that if the number of papers on the topic has evolved exponentially during the last decades, there is still no precise prescription for successful innovation. Several researchers have tested the effect of a large number of innovation-related variables. Looking at research by Souitaris (1999, 2002) and Wolf (1994), even though they tested similar variables, they discovered differing degrees of association with the rate of innovation. Additionally, according to Coombs et al. (1996), the innovation process is thus still poorly understood and the current state of the literature contributes little to improving our understanding of the phenomenon.

Hence, Indre (2009), the importance of new technologies and innovations for competitiveness and growth is a truism among managers, policy makers**,** and researchers. However, not all new technologies and innovations lead to success. Given the manifold technological opportunities and types of innovations from which firms can potentially choose, it is desirable to know which innovative activities and technologies are most clearly associated with improved competitiveness and growth. Arguably even more important is an understanding of the factors that make the success of new technologies and innovative activities more or less likely in general. The aim of this article is to provide some new insights regarding this topic.

According by Michael Peneder (2008), among industrial sectors, business services face the biggest finance-related barriers to innovation—probably due to their stronger dependence on intangible assets. Interestingly, a breakdown according to firm size reveals relatively few differences with respect to the first two variables. Small, as well as large firms perceive the 'high cost of innovation' and 'excessive economic risks' as hampering factors of almost equal proportion. However, access to appropriate sources of finance is a much greater problem among small enterprises as compared to medium-sized enterprises, while large firms are least affected.

There are different factors that may have an impact on the formation of inter-partner trust. Despite these open questions, one can conclude that the formation of trust is a challenging but profitable task in the management of inter-organizational projects that may be enhanced by carefully considering the composition of the project team and the design of project rewards.

The research questions will become the answers and it effecting to the technology innovation especially in finding the successful factors that effecting technology innovation in manufacturing industries. The specific questions as follows:

1. What is the relationship between knowledge and skill factor in the technology innovation at Malaysia?
2. What are the effects in implementing rule and regulations within technology innovation?
3. What is the relationship between management and technology innovation?
4. How the relationship between financial supports to a successful innovation?

Technology

According to Betz (1993) and Horwitch (1986), the word of Technology was commonly called as a collection of learning and to indicate the techniques that there using in manufacturing industries. However, the word of "technology" is usually using many kind of meaning in the scope of management but the real view of the definition is always been avert the term say that "there is no meaning for technology because it is the main factor being competitiveness in industries". Even though there are have a limitation to define the term of technology such as the term of "technology is utilizing science" which conceive technology as a body of scientific and technical knowledge that is needed to innovate.

Refers by Woodward (1965), technology has formerly spread in several of business activities and in the productions process. Currently now, according to Gaynor (1996), there is certain duties and works depending on the organization's order and actions which is can be widen and look out into the meaning of technology.

In fact, according to Chiesa and Barbeshi (1994), the strong affiliation of accomplishment and knowledge can enact the technology and certainly allow the generation of a series of profile innovations. According to Teece et al. (1997), the concept of technology is define when the strong incur of competence in the management of technology will bring the organization to be more in producing creating new steps and forms for their own goodness.

Technology Innovation

According to Mariano (2004), in her research has defined that technological advances were introduce in embracing the process in every production. There are using something new things in process and new forms in producing more outputs including using technology. Technology innovation is involving the experiments and research to create innovation and it has three phases which are invention, innovation and diffusion. However, the draft of technology innovation is the combination of the idea of a flow to generate, diffusion, and resort to technologies. It also has an exclusive development in doing research and development (R&D) to produce the innovation and applied the technology.

As indicated by Teece (1996), the characteristics of the technological innovation process in some recent works have expressed concern with identifying the characteristics of the technology innovation process. Furthermore, Arthur et al. (1987), the characteristics they mention are remarkably influenced by research carried out by evolutionary economists.

Therefore, we can say along with the OECD (2002) that ''the performance of an innovation system increasingly depends on the intensity and effectiveness of the interactions between the main factors involved in the generation and diffusion of knowledge.'' According to Freeman (1987) and Lundvall (1992), the innovation-system approach was developed and has been advanced. 1 Since its introduction, the concept of an innovation system has been successfully applied to the investigation of innovation activity mainly at the national level, and such studies have shown that a nation's capacity for innovation is determined not only by the simple summation of individual firms' capabilities but also by all linkages available.

The Critical Success Factors that Effecting Technology Innovation

Refers by Brown et al (1995), Cooper (1997), and Cooper et al (1995), the previous researches are currently renew about the explanation of firms' innovation success hence the innovations are

increasing the costs, insufficient times and complexity of technology. However, has a long research tradition and has lately received renewed attention due to increasing innovation costs, decreasing innovation times and increasing technology complexity. Researchers can be roughly divided into two camps: One group is looking into the internal success factors of innovations by, for example, analyzing the innovation process, corporate culture, cross functional teams and technological competence A first step in creating a meaningful report is finding an answer to the questions of how 'success' can be operationally defined and how the dimension 'success of educational innovation' can be tapped. In general, success can be seen as the accomplishment of goals and objectives necessary to achieve a particular task.

According to Madhavan *et* al. (1998) and Subramaniam *et* al. (2005), the strategic management literature recognizes innovation as a critical enabler for firms to create value and sustain competitive advantage in the increasingly complex and rapidly changing environment. As indicated by Montes et al. (2004), firms with greater innovativeness will be more successful in responding to changing environments and in developing new capabilities that allow them to achieve better performance.

Hence as concluded by Markus *et* al. (2000), for instance, project managers and implementation consultants, "often define success in terms of completing the project on time and within budget. But people whose job is to adopt ERP systems and use them to achieve business results tend to emphasize having a smooth transition to stable operations with the new system, achieving intended business improvements like inventory reductions, and gaining improved decision support capabilities".

The optimal success refers "to the best outcomes the organization could possibly achieve with enterprise systems, given its business situation, measured against a portfolio of project, early operational, and longer term business results metrics."

Product Innovation Success

As indicated by Cooper. (1984), product innovation rates are a common indicator for innovation success. Nevertheless, this indicator has some weakness in the sense that not all firms strive for the highest product innovation rates. He also studies on the body of literature discussing new product strategy. Therefore, companies were asked what percentages of their product innovation processes were commercially successful, e.g. matched their economic expectations (cf. for a similar approach).

In addition, according to Biemans *et* al. (1988), as they consider the extent of innovation to have an influence on innovation management and the external partners which are involved, the collected data on both product improvement and new product development (new products or known or even unknown customer groups).

Knowledge Management

In pioneering analysis by Youndt et al. (1996), there were few methods to build constructive in innovation process via innovation initiatives inclined based on the expert, commitment, and knowledge of workers as factors in creating the worthy creation process. According to Grant *et* al. (1996), the knowledge-based view depicts firms as repositories of knowledge and competencies. According to Ruggles (1998) and Scarbrough (2003), knowledge management is an approach to adding or creating value by more actively leveraging the knowhow and expertise resided in individual minds.

However, Nonaka (1994) proposed a theory of organizational knowledge creation where enterprises are encouraged to adopt novel ideas while reforming old operational procedures and creating new ones. Hence, Drucker (1985) define that there no other source in company for it competitiveness except knowledge as their advantage. According to stewart (1997), to begin any kind of business, then main factor the management of knowledge and human capital should be

an essential element of running any type of business, yet few individuals understand this challenging area; and given the potential knowledge management (KM) and intellectual capital as sources of innovation and renewal.

Although a firm has access to the knowledge, skills and expertise of employees, it may need to possess good capacities in managing knowledge management tools in place to ensure effective utilization of the human capital in the development of organizational expertise for innovation and the problems will be solve by the knowledge management.

Skills

As indicated by Leiponen (2000), in an earlier study, employees' skills were found to impact firms' profits. Thus, Lall (1992), he defines human capital as "not just the skills generated by formal education and training, but also those created by on-the-job training and experience of technological activity, and the legacy of inherited skills, attitudes and abilities that aid industrial development."

Furthermore, as by John (1997), skill is supposedly linked with complexity and variety of tasks, but complexity, in particular, remains undefined, while observation cannot easily get at cognition (judgment, problem-solving, and so on). It seemed that many of the most critical dimensions of skill remained hidden, that skill, competence, and expertise were 'black boxes', labels without a recipe or even a list of ingredients. It should be no surprise that, lacking an underlying rationale, public policies for training often began by asking employers what they wanted, followed by instruction, commonly in a classroom setting, in, say, troubleshooting digital electronics or using the latest word processing software.

As indicated by Rothwell et al. (1974), the need for skilled employees is not limited to the R&D function. The current view of innovation emphasizes information exchange and participation in innovation processes different units within firms, including marketing, manufacturing, research, and design and development.

Human Resource Practices

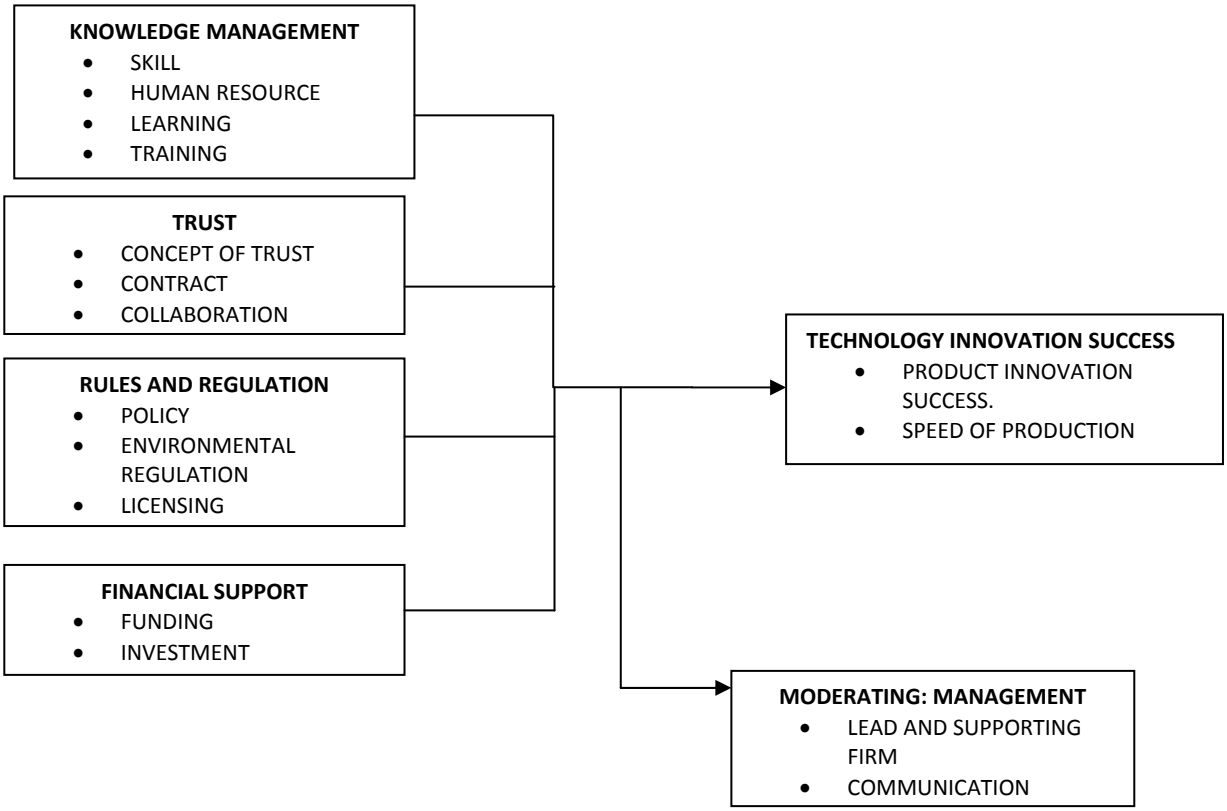
Accordingly Damanpour (1991) , Laursen *et* al. (2003), firms can use some strategic HR practices, such as staffing, training, participation, performance appraisal, and compensation, as means to motivate employees' commitment and get them involved in creative thinking and innovation. Tannenbaum *et* al. (1994), explore the relationships between organizational and environmental factors and the use of "innovative human resource practices". Explore the relationships between organizational and environmental factors and the use of "innovative human resource practices". Hence, as indicated by MacDuffie (1995), in investigating the impacts of "innovative human resource practices" on manufacturing performance, uses four measures including hiring, compensation, status barriers, and training to represent innovative human resource practices.

However, literature by Scarbrough (2003), when firms develop new products and improve management processes, they require the motivation and ability of human capital to produce creative ideas, develop innovative approaches, and exert new opportunities Collins et al. (2003), human resource management function can influence and modify the attitudes, capacities, and behaviors of employees to achieve organizational goals.

As indicated by Brockbank (1999), when firms use creative capabilities and innovative characteristics as hiring and selection criteria, their employees are likely to spawn diversity of ideas and commit to more innovation behaviors. Refers by Ulrich (1998), he concluded that to monitor human resource policies have a strategic dimension towards the creation and common share of knowledge and individual experiences. It is especially relevant to aim for organizational learning in the recruitment, selection, training, professional development, performance appraisal and compensation policies.

Surveys are the most common method of generating primary data. This is the main means of generating primary data, which are then gathered and assembled specifically for this study. A survey is a research technique in which information is gathered from a sample of people using questionnaire. Questionnaires are used in connection with many modes of observation in social research. Although structured questionnaires are essential to and most directly associated with survey research, they are also widely used in experiments, field research, and other data-collection activities. The study research framework is as follows.

Theoretical Frameworks for This Study



CONCLUSION

Although a firm has access to the knowledge, skills and expertise of employees, it may need to possess good capacities in managing knowledge management tools in place to ensure effective utilization of the human capital in the development of organizational expertise for innovation and the problems will be solve by the knowledge management.

Given the manifold technological opportunities and types of innovations from which firms can potentially choose, it is desirable to know which innovative activities and technologies are most clearly associated with improved competitiveness and growth. Arguably even more important is an understanding of the factors that make the success of new technologies and innovative activities more or less likely in general. The aim of this article is to provide some new insights regarding this topic.

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